L 10469-66

ACC NR: AP6003738   SOURCE CODE: CZ/0017/65/054/002/0081/0086

AUTHOR: First, Antonin (Engineer)

ORG: CKD, Electrical Engineering Plant, Prague (CKD, zavod Elektrotechnika)

TITLE: Analysis of cutouts for semiconductor rectifiers

SOURCE: Elektrotechnicky obzor, v. 54, no. 2, 1965, 81-86

TOPIC TAGS: semiconductor rectifier, semiconductor research, electric current

ABSTRACT: The article analyzes the design of cutouts for semiconductor rectifiers. An equation of the arc voltage of the cutout is given for calculation of the limited short-circuit current, and a concrete problem is solved with a computer. Information is presented on calculations of the interruption of the short-circuit current by the cutout in various circuits. This work was presented by J. Kadlec. Orig. art. has: 7 figures, 12 formulas, and 1 table. /JPRS/

SUB CODE: 09 / SUBM DATE: 19Jun64 / ORIG REF: 002 / OTH REF: 002

HW

Card 1/1   UDC: 621.314.63: 621.316.923

HEBKY, J.; KARASEK, M.; KEJHA, J.; FIRST, B.

Iodized amino acid and peptide derivatives. Chem Cz Chem 29 no.11:2814-2821 N '64.

1. Forschungsinstitut fur Pharmazie und Biochemie, Prague.

FIRST, J.

Meadows of Pribylina. p. 352

KRASY SLOVENSKA (Poverenictvo dopravy. Riaditelstvo pre cestovny ruch)
Bratislava Czechoslovakia

Vol. 36, no. 9, Sept. 1959

Monthly list of East European Accessions (EEAI) LC. Col. 9, no. 1   January 1960

Uncl.

FIRSTANOVA, A.D., vrach

Paramecia reaction in the diagnosis of malignant tumors of the female genital zone. Sbor. nauch. rab. Kaf. akush. i gin. GMI no.1:213-216 '60.
(MIRA 15:4)

1. Otdeleniye oblastnoy bol'nitsy im. Semashko, rukovoditel' S.S. Dobrotin, doktor med.nauk.
(GENERATIVE ORGANS, FEMALE--CANCER)   (PARAMECIUM)

POZKNJAKOV, YA. V., FIRSTOV, A.A.

Arctic Fox

Effect of feeding schedule on digestion on the arctic fox. Kar. i zver. 5 No. 2, 1952.

The nutritional value of albumin-vitamin for fur-bearing animals. A. A. Firstov. *Trudy Moskov. Pushno-Mekhovogo Inst.* 5, 113-21(1954).—All greens constitute a valuable source of albumin, carbohydrates, lipides, minerals, and vitamins for animals, in spite of their high content of undigestible cellulose, especially if they are formulated into a paste. Directions for prepg. this paste are given.

—— D. M. Chern

FIRSTOV   A. A.

USSR / Farm Animals. Wild Animals.   Q-4

Abs Jour : Ref Zhur - Biol., No 10, 1958, No 45267

Author   : Firstov, A. A.; Kharitonov, P. A.
Inst   : Not given
Title   : The Feeding of the Silver-Black Foxes During Pregnancy.

Orig Pub : Karakulevodstvo i zverovodstvo, 1957, No. 2, 27-29

Abstract : In feeding uniform rations of 625 large calories to silver-
           black foxes during the entire period of their pregnancy, 4.3
           whelps were obtained; when feeding reduced rations (550
           large calories) during the first half of the pregnancy and
           increased rations (700 large calories) during the second
           half of the pregnancy, the litters averaged 3.3 whelps per
           fox. It has been noticed that already in the beginning of
           the pregnancy the organism of the fox is capable of producing
           reserves of nitrogenous substances which are necessary for

Card 1/2

Journal of Applied Chemistry
June 1954
Industrial Inorganic Chemistry

(3)

Technology of producing cast iron treated with magnesium.
K. I. Vashchenko, P. G. Berezin, and A. N. Firstov (Liteinos
Proizvodstvo, 1953, 3, No. 1, 18—21).—After a review of factors
in nodular cast iron production and utilisation which require
study, the addition of Mg and its alloys to cast iron is con-
sidered in detail. Russian techniques for carrying out Mg add-
itions are critically reviewed from the aspects of effectiveness,
temp. drop, and safety. Data are given on the effects of S, Mn, and
Si, and the hardness and form of graphite in nodular irons containing
0·010—0·052% of Mg are compared. The harmful effects of P
are capable of mitigation by suitable heat-treatment.
J. IRON STEEL INST. (R.B.C.).

MYLKO, Sergey Nesterovich; FIRSTOV, Aleksey Nikolayevich; KONASHKO,
N.P., otv.red.; TEPLYAKOVA, A.S., red.

[Progressive foundry practices] Progressivnaia tekhnologiia
liteinogo proizvodstva. Kiev, 1960. 39 p. (Obshchestvo po
rasprostraneniiu politicheskikh i nauchnykh znanii Ukrainskoi
SSR. Ser.7, no.12).   (MIRA 14:4)
                    (Founding)

PHASE I BOOK EXPLOITATION   SOV/4475

Firstov, Aleksey Nikolayevich, Fedor Ivanovich Smirnov, and Mikhail Mikhaylovich
  Budylin

Mekhanizatsiya lit'ya v obolochkovyye formy (Mechanization of Shell-Mold Casting)
  Moscow, Mashgiz, 1960. 174 p. 6,000 copies printed.

Reviewer: R. I. Anpilogov, Engineer; Ed.: I. B. Pyasik, Engineer;
  Chief Ed. (Southern Division, Mashgiz): V. K. Serdyuk, Engineer; Ed.: P. Ya.
  Furer.

PURPOSE: This book is intended for technical personnel in foundries.

COVERAGE: The book deals with the large-scale mechanization of the shell-mold
  casting process in large-lot and mass production. The authors present recom-
  mendations for selecting proper materials for the molds and charge, describe
  what they consider to be the most efficient technique of casting, and discuss
  equipment required for the operation. Technical and economic indices of shell-
  mold casting are presented, and measures for safeguarding the health of foundry

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Mechanization of Shell-Mold (Cont.)   SOV/4475

workers are suggested. The book is based on the experiences of the Kiyev-skiy mototsikletnyy zavod (Kiyev Motorcycle Plant) and other foundries.
There are 20 references, all Soviet.

TABLE OF CONTENTS:

Card 2/6

DMITRIYEV, Anatoliy Vasil'yevich; FIRSTOV, A.N., kand.tekhn.nauk, retsenzent; ONISHCHENKO, N.P., inzh., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn.red.

[Guide for workers in foundry chipping and cleaning departments]
Pamiatka dlia rabochikh obrubnykh i ochistnykh otdelenii liteinykh tsekhov. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 50 p.
(Foundries--Safety measures)   (MIRA 14:3)

VASHCHENKO, K.I.; AVRINSKIY, P.V.; FIRSTOV, A.N.; NESELOVSKIY, V.L.;
Prinimali uchastiye: VARENIK, P. A.; YAKOVENKO, G.F.; SHEVCHUK, R.S.;
NOSOVA, Ye. M.; KUGEL', A.V.; SHTYKA, G.N.; MONDZELEVSKIY, S.P.

Vats for the fusion of caustic soda. Lit. proizv. no.6:4-6 Je '61.
(MIRA 14:6)

(Iron founding)
(Chemical engineering—Equipment and supplies)

VASHCHENKO, K.I.; FIRSTOV, A.N.; ZHIZHCHENKO, V.V.; KADUCHENKO, A.G.;
GOLOVAN', N.A.

Bimetallic motor cylinders for motorcycles. Lit. proizv.
no.8:16-18 Ag '61.   (MIRA 14:7)
          (Motorcycles) (Laminated metals)

VASHCHENKO, Konstantin Il'ich, doktor tekhn, nauk, prof.; ZHIZHCHENKO,
        Valentin Vasil'yevich, inzh.; FIRSTOV, Aleksey Nikolayevich,
        kand. tekhn. nauk, dots.; SLITSKAYA, I.M., inzh., red.;
        VASIL'YEV, Yu.A., red. izd-va; BELOGUROVA, I.A., tekhn. red.

[Bimetal aluminum-iron castings]Bimetallicheskie otlivki aliuminii-
zhelezo s diffuzionnoi sviaz'iu. Leningrad, 1962. 25 p. (Lenin-
gradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym
opytom. Seriia: Liteinoe proizvodstvo, no.1)   (MIRA 15:9)
        (Laminated metals) (Founding)

VASHCHENKO, K.I., doktor tekhn.nauk; FIRSTOV, A.N., kand.tekhn.nauk;
ZHIZHCHENKO, V.V., kand.tekhn.nauk; DUPLYAK, V.D., inzh.; AVDOKUSHIN,
V.P., inzh.; KOSTENKO, G.D., inzh.; GOLOVAN', N.A., inzh.

Die-casting of bimetallic motorcycle cylinders. Mashinostroenie
no.4:65-68 Jl-Ag '65.   (MIRA 18:8)

34186-66   EWP(R)/EWT(m)/T/EWP(t)/ETI   IJP(c)   GD/JH
SOURCE CODE: UR/0418/66/000/001/0043/0046

ACC NR: AP6026024

AUTHOR: Vashchenko, K. I. (Doctor of technical sciences); Zhizhchenko, V. V.
(Candidate of technical sciences); Firstov, A. N. (Candidate of technical sciences);
Kostenko, G. D. (Engineer)

ORG: none

TITLE: Intensity of iron saturation in calorizing alloys and methods for refining
them

SOURCE: Tekhnologiya i organizatsiya proizvodstva, no. 1, 1966, 43-46

TOPIC TAGS: aluminum containing alloy, metallurgic process, metal purification,
binary alloy, temperature test, metal melting, intermetallic compound, iron containing
alloy, metallurgy

ABSTRACT: The authors point out that the extent to which aluminum alloys are
saturated by iron during calorizing has not been studied up to the present time
and little effort has been made to develop methods for purifying these alloys.
The problem of refining is important not only from the standpoint of producing
binary alloy castings but also for purification of cast aluminum alloys in
which iron is a harmful impurity.

Iron saturation was studied for pure aluminum and for aluminum alloys with
7.15 and 28% zinc, as well as in a zinc alloy with 0.2% aluminum since these

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L 34186-66

ACC NR: AP6026024

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alloys are recommended for use in calorizing. Zinc alloy specimens with 0.2% aluminum were calorized at 535-545°C, aluminum alloys at 680-690 and 720-730°C and pure aluminum at 680-690, 720-730 and 780-790°C. Each specimen was held in the calorizing alloy for five minutes. After every five specimens had been calorized, metal samples weighing 8-10 g were removed from the vat for determining iron concentration. It was found that the specific rate of dissolution and the intensity of iron saturation are increased by raising the calorizing temperature. This is due to an increase in the activity of the melts with respect to iron (the degree of heating and the saturation limit of the iron melt increase.)

The specific rate for dissolving of cast iron in an aluminum alloy with 7% Zn shows the same relationship to iron concentration as for pure aluminum. An increase in temperature from 680-690 to 720-730°C has no effect on specific rate of dissolving. Specific rate of dissolving is increased by raising the zinc content in the melt and at a concentration of 28% the rate is the same as for pure aluminum. However, the relationship between specific rate of dissolving and iron concentration in the calorizing alloy is stronger and differs somewhat from that for pure aluminum.

A sharp reduction in the specific rate of dissolving is observed at iron concentrations below 1.0-1.4% as a function of the calorizing temperature. Beyond this point, there is some increase in the dissolving rate after which it remains practically constant. This type of behavior in the specific rate of dissolving as a function of iron concentration is due to the extreme iron deficiency

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ACC NR: AP6026024

(0.012-0.018%) in the eutectic of the Zn-Fe system and the formation of inter-
metallic compounds at rather low iron concentrations.

The formation of Fe-Zn and Fe-Al intermetallic compounds (and possibly more
complex systems) stabilizes the rate of dissolving. A zinc alloy with 0.2%
aluminum yields satisfactory results in calorizing cast iron and steel. Iron
saturation of this alloy is much lower than for aluminum or aluminum-zinc alloys.
The specific rate of dissolution for iron in this alloy is also very low and
increases somewhat with an increase in iron concentration in the alloy. Low
iron saturation intensity in a Zn+0.2%Al alloy is due to the low calorizing
temperature. Thus, the bath is quite highly saturated with iron during
calorizing of steel in aluminum and aluminum alloys.

Two refining methods were tested: settling and filtering. Both methods are
based on a reduction in the solubility of iron in aluminum and its alloys when
the temperature is reduced. During settling, excess iron which is separated
out in the form of aluminides or zincates is precipitated to the bottom of the
vat due to its higher specific gravity. In the case of filtering, these iron
compounds are retained by the filter for the same reason. Pure aluminum and
aluminum-zinc alloy with 28% zinc with various initial iron concentrations were
refined. The settling and filtering processes were carried out at a temperature
10-15°C above the solidus temperature. The settling time was four hours.
Fusion of the refined alloys with zinc (up to 72% Zn) was used for reducing the

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L 34100-66

ACC NR: AP6026024

solidus temperature. It was found that filtering is an extremely effective refining process and is simpler and less expensive than the settling method. This method is particularly recommended for refining aluminum alloys containing zinc (Al+5-28% Zn and several cast alloys, e.g., AL111, AL114, AL115V, etc.), since the addition of up to 72% zinc to these alloys results in an extremely high purification from iron. Orig. art. has: 2 figures and 1 table. [JPRS: 35,432]

SUB CODE: 11 / SUBM DATE: none

Card 4/4

L 39:10-55   ЕТ(л)/ЕЕ(l)/ЕЕ/ЕЕ(k)   IJP(c)   JD

ACC NR: AP6030381   SOURCE CODE: UR/0148/66/000/004/0137/0141

AUTHOR: Vashchenko, K. I.; Firstov, A. N.; Belotskiy, A. V.; Duplyak, V. D.;
Kostenko, G. D.

ORG: Kiev Polytechnical Institute (Kiyevskiy politekhnicheskiy institut)

TITLE: Structure and phase composition of the diffusion layer in bimetallic
iron-aluminum castings

SOURCE: IVUZ. Chernaya metallurgiya, no. 4, 1966, 137-141

TOPIC TAGS: phase composition, binary alloy, iron aluminum alloy

ABSTRACT: The report studies the structure and phase composition of the
diffusion layer of specimens of Armco iron (0.014 % C), steel grades 20
and U8 and cast iron grade SCh 21-40, aluminized at different temperatures
and aged in a melt of pure aluminum or in an aluminum alloy with 4 % Si
and 7 % Zn.

       Cylindrical specimens 10 mm in diameter and 30 mm long were alumi-
nized in small tanks of thin sheet iron 25 mm in diameter and 45 mm high
which were immersed in a crucible containing the aluminum melt.

       Specimens 18 mm in diameter and 70 mm long were aluminized directly
in the crucible and then had the aluminum melt poured over them in a sand
mold at a temperature of 720-730° C. From the bimetallic billets thus
obtained sections and specimens for tensile testing were prepared.

       Binary alloys were prepared in an electric arc crucibleless furnace
with a protective (argon) atmosphere. Charge materials were Armco iron
and AV00 grade aluminum.

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L 39110-66

ACC NR: AP6030381   4   1

        In the aluminizing of Armco iron in pure aluminum, the diffusion
layer consisted of two zones: a thick zone of columnar crystallites adjoin-
ing the iron, and, considerably thicker, a fine crystalline zone (2-3
microns) adjoining the aluminum. The columnar crystallites grew predomi-
nantly in a direction perpendicular to the front of the reactive diffusion
(toward the specimen surface) with the formation of characteristic protu-
sions -- tongues.
        Formation of the two-phase layer is the result of reactive diffusion
in the solid iron - aluminum melt system: the diffusion of aluminum atoms
promotes the growth of columnar crystallites and the overall thickness of
the layer, and in the straightforward diffusion of iron, atoms change in
the condition of equilibrium of the system which leads to a decrease in
layer thickness. From the thermodynamic point of view, this phenomenon
boils down to an increase in entropy of displacement and decrease in the
free energy of the system and, therefore, proceeds spontaneously and irre-
versibly.
        The results of microstructural and chemical analyses were confirmed
by roentgenographic investigation. Orig. art. has: 3 figures. [JPRS: 36,728]

SUB CODE: 11 / SUBM DATE: 13Apr65 / ORIG REF: 005 / OTH REF: 009

Card 2/2 MLP

FIRSTOV, N.I.

FIRSTOV, N.I.

Speed of the reproduction of tarbagan populations in areas where control measures have been carried out. Izv. Irk.gos. protivochum. inst. 10:45-53 '52.   (MIRA 10:12)
(TRANSBAIKALIA--MARMOTS)

FIRSTOV, N.I.

Extermination of rats in freight cars by the use of automobile
exhaust. Tez.i dokl.konf.Irk.gos.nauch.-issl.protivochum.inst.
no.1:42-43 '55.   (MIRA 11:3)
          (RATS--EXTERMINATION) (RAILROADS--SANITATION) (CARBON MONOXIDE)

FIRSTOV, N.I.

Distribution of rodents on the southern frontier of the Altai.
Izv.Irk.gos.nauch.-issl.protibochum.inst. 16:102-109 '57.

(MIRA 13:7)

(GORNO-ALTAI AUTONOMOUS PROVINCE—RODENTIA)

FIRSTOV, N.I.

Eastern limits of the water vole. Izv.Irk.gos.nauch.-issl.
protivochum.inst. 16:125-129 '57.   (MIRA 13:7)
          (SIBERIA, EASTERN--WATER VOLES)

NEKIPELOV, N.V.; FIRSTOV, N.I.

Carbon monoxide in controlling house rodents. Izv.Irk.gos.nauch.-
issl.protivochum.inst. 16:249 '57.   (MIRA 13:7)
            (CARBON MONOXIDE--PHYSIOLOGICAL EFFECT)
                    (RODENT CONTROL)

FIRSTOV, N.I.

Intensity of the settlement by household mice of urban
industrial premises. Izv.Irk.gos.nauch.-issl.protivochum.
inst. 19:92-94 '58.   (MIRA 13:7)
          (Irkutsk—Mice)

NEKIPELOV, N.V.; FIRSTOV, N.I.

Use of cylinders with carbon monoxide for exterminating
household rodents. Izv.Irk.gos.nauch.-issl.protivochum.
inst. 19:157-160 '58.   (MIRA 13:7)
          (Rodent control)
      (Carbon monoxide—Physiological effect)

FIRSTOV, N.I.

Still more on the selective attitude of gray rats toward
various types of poisoned baits and on the comparative
effectiveness of some trapping devices. Izv.Irk.gos.nauch.-
issl.protivochum.inst. 19:161-163 '58.   (MIRA 13:7)
                    (Rodent baits and repellants)
                    (Irkutsk--Rats)

L 24469-66   EWT(m)/ETC(f)/EPF(n)-2/EWG(m)/T/EWP(t)   IJP(c)   JD/JG/GS

ACC NR: AT6010572   (N)   SOURCE CODE: UR/0000/65/000/000/0029/0041

AUTHOR: Mil'man, Yu. V.; Rachek, A. P.; Trefilov, V. I.; Udovenko, A. A.; Firstov, S. A.; Yaremchuk, V. V.

ORG: Institute of Physics of Metals AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Mechanism of plastic deformation in alloys of transition metals

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 29-41

TOPIC TAGS: plastic deformation, cast alloy, phase transition, twinning, material fracture

ABSTRACT: The paper is a continuation of a previous work (Mil'man, Yu. V., Trefilov, V. I., Rachek, A. P., "Problems in the Physics and Science of Metals, 20", Naukova dumka, Kiev, 1964) devoted to the mechanism of plastic deformation and brittle fracture of alloys of elements in group VIA with other transition metals. The following alloy systems are studied: Cr-Mn, Cr-Ru, Cr-Fe, Cr-Os, W-Re, Mo-Re, Nb-Re and Mo-Ti. The alloys were studied in the cast state and in some cases were subjected to heat

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L 24469-66
ACC NR: AT6010572   3

treatment. The relationship between the packing flaw energy and the electronic structure of the alloy is analyzed. It is shown that both transition and nontransition metals conform to the Seger rule on high energies for packing defects in metals. The twinning ≠ slipping transition in alloys of transition metals is studied. All alloys of elements in group VIA with metals in groups VIIA and VIIIA show a transition to twinning, while alloys with elements in group VIA (Mo-Ti alloys) show no twinning throughout the entire region of solid solutions with a bcc lattice under maximum loads. Experimental data show that alloying chromium, molybdenum and tungsten with metals of groups VIIA and VIII reduces the packing flaw energy and causes a transition to deformation by twinning (or to combined deformation by slipping and twinning). A brief survey of the literature shows no transition to twinning in alloys of group VIA with transition metals to the left of the chromium group in the periodic table. Orig. art. has: 8 figures.

SUB CODE: 11/ SUBM DATE: 14Nov64/ ORIG REF: 003/ OTH REF: 026

Refracting metals
               27

Card 2/2

L 12028 16   EWT(m)/EWP(k)/T/EWP(t)/ETI   IJP(c)   JD/JW/JG/GD

AUTHOR: Gridnev, V. N.; Ivashchenko, R. K.; Mil'man, Yu. V.; Trefilov, V. I.; Firstov, S. A.

ORG: Institute of Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: Investigation of the effect of highly active elements on the plasticity of chromium

ABSTRACT: The article deals with the refining of chromium by treatment with highly active elements which react with the interstitial impurities in Cr to form more stable compounds than the corresponding Cr compounds. To this end, the use of Y and other rare-earth elements is particularly promising since then it is often possible to improve not only the plasticity but also the high temperature strength of the alloy. However, there is no common consensus on this effect of Y and rare-earth elements. Thus, O. N. Carlson et al. (Less Common Metals, 1964, 6, 6, 439) present experimental findings indicating that the temperature of cold brittle-

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L 41026-66

ACC NR: AT6009600

ness of cast Cr increases when it is treated with Y and other rare-earth elements. To clear up this contradiction, specimens of Cr treated with Y as well as of pure Cr in soldered and evacuated ampoules were annealed at 1200°C for 1 hr and water-quenched. By means of Vickers hardness tests, aging of these specimens was investigated at three temperatures (275°, 350° and 400°C) in a molten-tin bath. The findings on the increase in microhardness with aging are presented in Fig. 1, where each point represents the mean of 8-10 measurements. Fig. 1
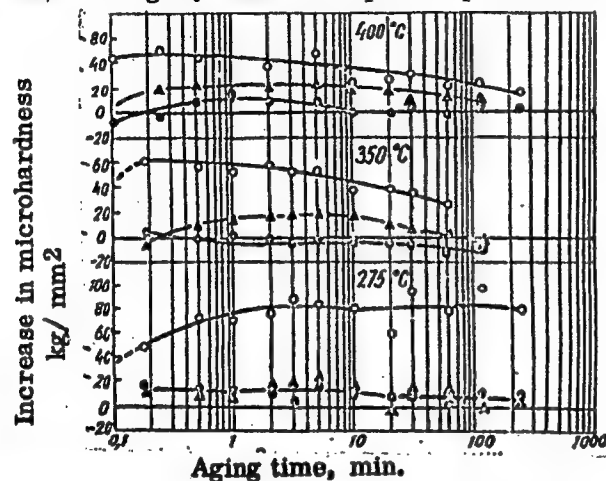
Fig. 1. Effect of treatment with Y and Pr on the aging of Cr:

O – zone-refined Cr; $\bullet$ – alloy of Cr + 1% Y; $\triangle$ – alloy of Cr + 1% Pr

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L 41026-66

ACC NR: AT6009600   3

indicates that the addition of Y virtually suppresses the processes of aging in the alloy (and hence also it suppresses the rise in the temperature of cold brittleness due to the segregation of an interstitial impurity -- nitrogen -- from the solid solution). These findings confirm the feasibility of using Y to improve the refining of Cr, since Y binds the greater part of nitrogen into nitrides, thus suppressing most of the effects of aging. Further tests, involving the treatment of Cr with microamounts of Y and Pr over a broad temperature range: from the temperature of liquid hydrogen to +900°C, showed, that such treatment enhances the microhard-ness of Cr at elevated temperatures,   Orig. art. has: 5 figures.

SUB CODE: 13, 11, 20/ SUBM DATE: 12Oct64/ ORIG REF: 005/ OTH REF: 026/

Card 3/3   hs

ACC NR: AP7005136   SOURCE CODE: UR/0126/66/022/004/0611/0616

AUTHOR: Trefilov, V. I.; Firstov, S. A.

ORG: Institute of Metal Physics, AN UkrSSR (Institut metallofiziki AN UkrSSR)

TITLE: A study of deformation and crack formation in thin chromium foils

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 4, 1966, 611-616

TOPIC TAGS: chromium, thin film, brittleness, material fracture, electron microscopy, plastic deformation, crystal dislocation, grain structure, CRACK PROPAGATION

ABSTRACT: Electron microscopy was used to study deformation and crack formation in thin chromium foils. The chromium foils were made from ingots which were arc melted in argon. Circular, self-supporting samples were made from discs which were gradually thinned toward the center (thinnest section), and cracks were induced at the center by pricking the disc near the edge. This method allowed various stages of deformation as well as crack formation to be studied. An electron micrograph showed slip traces caused by the intersection of mobile dislocations with the oxide layer formed by electron bombardment. These slip traces were identified with surface interactions. Dislocations accumulated in the slip planes along the boundaries of the foil as a result of retarded motion. Three slip planes were observed: {110}, {112}, and {123}. Aging the foils at room temperature or heating to 350°C in the microscope column did not af-

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ACC NR: AP7005136

fect the microstructures. Electron micrographs were also given of fractured center
sections of the sample disc. Both intercrystalline and transcrystalline cracks form-
ed. Cracks along grain boundaries did not result in much plastic deformation in neigh-
boring areas. It was hypothesized that these were caused by dislocations moving at
stresses below the elastic limit of the material, accumulating in grain boundaries,
and nucleating as cracks at well below the elastic limit. Interactions of transcrys-
talline cracks with grain boundaries also occurred. Cracks penetrating into the thick-
er sections of the foil were bent at the point where the crack stopped propagating.
This region showed heavy plastic deformation. The slip plane reactions necessary to
form cracks (Cottrell mechanism) were outlined by slip traces in the foil which ad-
joined the crack edges. Slip planes and directions were given for microcrack nuclea-
tion in the foils. The microcracks lay along the {112} plane and did not have the
orientations necessitated by the Cottrell mechanism. In utilizing these results in
foils it is necessary to consider the details of deformation in foils, particularly
the stress state and surface effects. Orig. art. has: 5 figures, 1 table, 1 formula.

SUB CODE: 11,20/   SUBM DATE: 09Nov65/   ORIG REF: 009/   OTH REF: 006

Card 2/2

RYBALKO, F.P.; FIRSTOV, V.A.; BESPAMYATNYKH, S.G.

Effect of discontinuities on the statistics of distribution
of plastic deformation. Fiz. tver. tela 6 no.8:2333-2336
Ag '64.   (MIRA 17:11)

1. Ural'skiy gosudarstvennyy universitet imeni Gor'kogo,
Sverdlovsk.

IVANOV, Nikolay Nikolayevich, prof.; POROYKOV, Ivan Vasil'yevich, prof.;
FIRSTOV, V.G., red.; ZUBKOVA, M.S., red.izd-va; DONSKAYA, G.D.,
tekhn.red.

[Use of achievements in physics in constructing roads; electro-
physical measurements] Primenenie dostizhenii fiziki v stroi-
tel'stve avtomobil'nykh dorog; elektrofizicheskie izmereniia.
Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo transp. i
shosseinykh dorog RSFSR, 1960. 147 p.

(MIRA 14:4)

(Electronic measurements)   (Road construction)

FIRSTOV, V.G., inzh.

Automatic control of the companion of concrete pavements. Bet. i
zhel.-bet. no.1:31-33 Ja '61.
      (Automatic control)
(MIRA 14:2)
         (Pavements, Concrete)

FIRSTOV, V.G.

Radiometric control of the compaction of the roadbed. Avt.dor. 24
no.4:22-23 Ap '61.
                 (Soil stabilization)   (Radiometers)   (MIRA 14:5)

FIRSTOV, V. I.

USSR/Chemistry – Halogenated Hydrocarbons   Sep/Oct 51

"Synthesis and Properties of Certain Polyhalogen Derivatives of Propane and Propene Containing the Trichloromethyl Group," A. N. Nesmeyanov, R. Kh. Freydlina, V. I. Firstov, Inst of Org Chem, Acad Sci USSR

"Iz Ak Nauk SSSR, Otdel,Khim Nauk" No 5, pp 505-511

Action of KOH on $CCl_3CH_2CH_2Cl$ yielded $CCl_2= CHCH_2Cl$ and $CCl_3CH=CH_2$ (latter compd never before prepd). By series of reactions starting from these 2 compds, prepd 8 new compds contg CCl_2 and CCl_3 groups. Of compds contg CCl_3 group, 2 were Br-substituted.

PA 195T5

FIRSTOV, V. I.

5 Chem.
③

Chem Abs VYT
1-25-54
Organic Chemistry

1,1,1-Trichloropropene. R. Kh. Freidlina and V. I.
Firstov. *Akad. Nauk S.S.S.R., Inst. Org. Khim.; Sintezy
Org. Soedinenii, Sbornik* 2, 134-5(1952).—To 50 g. CCl_3-
CH_2CH_2Cl is added with stirring and cooling to 0° over 6
hrs. 20 g. KOH in 100 ml. abs. EtOH. Dilg. with H_2O,
drying the org. layer, and then distg. gave 50% CCl_3CH:-
CH_2 (I), b. 101-3° (pure b. 101-2°, n_D^{20} 1.4680, d_{20} 1.3292),
along with some 30% *1,1,3-trichloro-1-propene*, b. 131-3°.
I heated in steel ampul 3 hrs. at 150° isomerizes to the latter
substance, b. 131-2°, n_D^{20} 1.4900, d_{20} 1.3040.   G. M. K.

MF
7-28-54

FIRSTOV, V.P.,uchitel'

Solution of experimental problems during the recitation period.
Khim. v shkole 15 no.6:80-81 N-D '60.   (MIRA 13:11)

1. Srednyaya shkola No.11 sovkhoza "Yuzhnyy" Krasnodarskogo kraya.
              (Chemistry--Study and teaching)

BYCHKOV, I.Ya.; YERMOLAYEV, I.S.; PIRSTOVA, V.M., redaktor; SACHEVA, A.I.,
tekhnicheskikh redaktor.

[Manual for administrative and management workers in institutes of
public health] Spravochnik administrativno-khoziaistvennogo rabotnika
uchrezhdenii zdravookhraneniia. Moskva, Gos.izd-vo meditsinskoi lit-
ry, 1955. 475 p.

(PUBLIC HEALTH)

USSR / Human and Animal Physiology. Carbohydrate Metabolism.   T

Abs Jour   : Ref Zhur - Biol., No 15, 1958, No. 69851

Author   : Iazarev, G. I.; Firsunkova, S. Ya., Postylyakova, R. I.;
             Grivina, V. V.
Inst   : Kostromsk Agricultural Institute
Title   : Conditioned Reflex Influence on the Blood Sugar Level and
             on the Formed Elements of the Blood

Orig Pub   : Tr. Kostromsk. s.-kh. in-ta, 1957, No 1, 117-121

Abstract   : No abstract given

Card 1/1

GEYGL, L. [Heihl, L.]; BELAN, A.; FIRT, A.

Indications for and technic and functional evaluation of phlebo-
graphy of the lower extremities. Khirurgiia 36 no.9:34-3% S '60.
(MIRA 13:11)

1. Iz Instituta klinicheskoy i eksperimental'noy khirurgii v
Prage (dir. - dotsent B. Shpachek).
(LEG—BLOOD SUPPLY)   (ANGIOGRAPHY)

FIRT, L.

    Phantom limb. Voj.zdrav.listy 19 no.3-4:81-89 '50. (CLML 19:3)

FIRT, L.

Four principles in resuscitation of the wounded. Voj.zdrav.listy
19 no.11-12:261-263 Nov-Dec 50.   (CLML 20:5)

FIRT, P.

Deodorization of hospital rooms. Roshl. chir., 29:6, 1950. p. 235-7

1. Of the Surgical Department of the State District Hospital in
Prague VIII-Bulovce (Head--Prof. Jan Knobloch, M. D.).

CLL 19, 5, Nov., 1950

FIRT, P.;HEJHAL, L.

Sodium citrate of a main cause of cardiac insufficiency in rapid transfusions. Cas. lek. cesk 92 no.49-50:1357-1367 4 Dec 1953.

(CIML 25:5)

1. Of the Experimental Department (Head of Research—Docent P. Malek, M.D.) of the Institute of Experimental Surgery (Director—Docent B. Spacek, M.D.), Prague.

Firt, P.

Excerpta Medica Sec 6 Internal Medicine Vol. 9/6 June 55

2. GENERAL THERAPY

TRANSFUSION OF BLOOD, PLASMA AND BLOOD SUBSTITUENTS

3442. FIRT P. and HEJHAL L. Ústav pro exp. a klin. Chir., Praha. *Otázky ry-
chlých intravenosních transfusí. Rapid intravenous transfusions
ROZHL. CHIR. 1954, 33/5-6 (221-242) Graphs 13 Tables 8
Experiments in dogs showed that intravenous transfusion may be given much more
rapidly than has hitherto been routine, and that it is the addition of sodium citrate
to the donor blood which has been the cause of overstrain and heart failure. The
rate of transfusion of heparinized blood may be adjusted to the requirements of the
organism involved. Further experiments showed that the ill-effects caused by
transfusion of citrate blood may be controlled by addition of calcium gluconate
and procaine. The rate of transfusion and the effect of sodium citrate and calcium
gluconate may be determined by registration of the venous blood pressure, the
physiological initial value of which should not be exceeded during transfusion.
Findings show that intravenous transfusion may be carried out considerably more
swiftly than intra-arterial transfusion, so that the latter would seem to be super-
fluous.   Pavlansky - Prague (IX, 6)

FIAT P,   ...DICA   Sec. 6   Vol. 11/5 May 57

3012. FIRT P. and HEJHAL L. Inst. of Clin.and Exp. Surg., Prague-Krč. *Sodi-
um citrate - one of the main causes of cardiac overload-
ing and failure in rapid blood transfusion REV. CZECH. MED.
1955, 1/1 (20-42) Graphs 19 Tables 2
The authors investigated the mechanism of cardiac overloading and failure frequent-
ly observed in rapid intravenous transfusions. In experiments on dogs, a rate of
transfusion of heparinized blood of 6 ml./kg./min. was given with no ill-effects;
however, citrated blood transfusions produced certain haemodynamic disturbances.
Small intravenous doses of citrate administered to dogs revealed a marked vaso-
constriction in the pulmonary network that produces a strain on the right ventricle.
In high concentrations, it weakens cardiac action by direct action on the myocardi-
um. From these experiments it is concluded that it is the sodium citrate and not
the blood itself which is the cause of cardiac overloading and failure in rapid intra-
venous transfusions. Since it is not possible to use heparinized blood in clinical
practice, the rapid intravenous transfusion of citrated blood is administered simul-
taneously with calcium gluconate and procaine. These drugs counteract the un-
favourable effect of sodium citrate as reflected by the results of its use clinically
for 2 yr.
                                    Hale - Cleveland, O. (IX, 6)

FIRT, P

HEJHAL, L.;STERBA, O.;FIRT, P.

Pathogenesis and treatment of hemorrhages. Rozhl. chir. 36 no.4:225-234 Apr 57.

1. Ustav klinicke a experimentalni cirurgie, Praha Ustav hematologie a krevni transfuse, Praha.
(HEMORRHAGE,
etiopathogen. & management (Cz))

MINAR, J.; FIRT, R.; HEJAL, L.; JADRNY, J.; POSSNER, M.; STUCHLIK, E.; SAUER, J.;
VRUBLOVA, J.; ZAK, R.

Clinical experiences with the treatment of severe hemorrhage. Roshl.
chir. 36 no.4:235-242 Apr 57.
   (HEMORRHAGE, ther.
      rapid extensive intravenous transfusion (Cz))
   (BLOOD TRANSFUSION , in var. dis.
      hemorrh.rapid extensive intravenous transfusion (Cz))

FIRT, Pavel; HEJHAL, Libor

Critic of the so-called Moszkovicz operation of varicose veins.
Rozhl. chir. 36 no.6:393-401 June 57.

1. Ustav klinicke a experimentalni chirurgie, reditel doc. MUDr
Bohumil Spacek.
       (VARICOSE VEINS, surg.
              Moszkowicz operation, critical evaluation based on
              follow-up studies (Cz))

847. (295) TREATMENT OF SEVERE HAEMORRHAGE - Firt P. and Hejhal
L. Inst. for Clin. and Exp. Surg., Prague - LANCET 1957, 2/7006 (1132-
1137) Graphs 11

Judging from experiments on more than 500 dogs and clinical trials extending over
3 yr., failures are of 3 kinds. In the largest group the rate and amount of blood
transfused were insufficient. In a smaller group the amount and rate seem suffici-
ent but the patient deteriorates with continuing transfusions. Most of these failures
are a result of the grave initial state of the patient - particularly severe shock and
irreversible changes. In the smallest group the rate and amount of transfused
blood, otherwise corresponding to the patient's needs, induce cardiac failure.
Recognition of the 3rd group led to great caution in giving rapid transfusions.
Overloading and failure of the heart during rapid transfusions is not a function of
transfusion per se but of the amount of citrate given. Even in small doses citrate
produces vasoconstriction in the pulmonary vascular bed, and in larger doses de-
presses myocardial activity, both effects leading to cardiac overloading and failure.
The effect of citrate during transfusion can be safely counteracted by the simul-
taneous i.v. administration of calcium and procaine.   Bruusgaard - Oslo (IX, 19)

FIRT, P.; HEJHAL, L.; STERBA, O.; BEDNARIK, T.

Arterial non-suture anastomosis with a fibrin ring. Rozhl. chir. 37
no.4:217-226 Apr 58.

1. Ustav klinicke a experimentalni chirurgie, reditel doc. Dr. B. Spacek,
a Ustav hematologie a krevni transfuse, reditel Dr. J. Kidery, Praha.
P. F., Praha 13, SNB 75.
        (AORTA, surg.
                anastomoses with fibrin ring in dogs, pathol. (Cz))
        (FIBRIN
                fibrin ring in aortic anastomoses in dogs, pathol. (Cz))

3442. PHLEBOGRAPHY OF THE LOWER LIMBS - Flebografie dolních končetin - Firt P., Belán A. and Hejdal L. Úst. Klin. a Exp. Chir., Praha - ROZHL. CHIR., 1958, 37/4 (227-235) Tables 1 Illus. 32

The contrast medium is injected into a vein of the foot with the patient erect. Immediately after completing the injection a picture in an a.p. direction is taken. The next a.p. picture follows after 1 min. after which a lateral radiograph is taken while the patient stands on his toes. Before taking the last radiograph an elastic dressing is applied for compression of the superficial veins.

Gottlob - Vienna (IX, 14)

HEJHAL, L.; FIRT, P.

Dextran; colloidal solution infusions. Cas. lek. cesk. 97 no.25. Lek. veda zahr:121-134 20 June 58.

1. Ustav klinicke a experimentalni chirurgie, Praha.
   (DEXTRAN
        properties & ther. use, review (Cz))

GEYGAL, L.; FIRT, P.; SHTERBA, O. [Šterba, O.]; BEDNARZHIK, T. [Bednařík, T.]

Vascular anastomosis without angiorrhaphy. Eksp.khir. 4
no.2:24-30 Mr-Ap '59.   (MIRA 12:5)

1. Iz Instituta klinicheskoy i eksperimental'noy khirurgii v
Prage (dir. B.Shpachek) i Instituta gematologii i transfuzii
v Prage (dir. - doktor med.nauk prof. I.Gorzheyshi).
            (BLOOD VESSELS, surg.
                anastomosis with fibrin ring & without
                suturing in animals (Rus))

HEJHAL, L.; FIRT, P.; LIVORA, D.

Endovascular electrocoagulation of superficial varices of leg.
Rozhl. chir. 38 no.6:418-425 June 59

1. Ustav klinicke a experimentalni chirurgie v Praze,reditel prof.dr.
B. Spacek Nemocnice Na Frantisku v Praze, I. chir. odd. prednosta prim.
dr. V. Cermak.

      (VARICOSE VEINS, ther.)
      (ELECTROCOAGULATION)

BEDNARZHIK, T.; SHTERBA, O.; GEYGAL, L.; FIRT, P.

Fibrin muff for joining blood vessels without sutures. Probl. gemat.
i perel. krovi 5 no.2:39-42 F '60.   (MIRA 14:5)

1. Iz Instituta gematologii i perelivaniya krovi i Instituta
klinicheskoy i eksperimental'noy khirurgii v Prage.
              (BLOOD VESSESL--SURGERY)

FIRT, P.; HEJHAL, L.

Contribution to surgical therapy of arterial aneurysms. Rozhl.
chir.40 no.2-3:83-92 Mr '61.

1. Ustav klinicke a experimentalni chirurgie, Praha-Krc, reditel
prof. MUDr. B.Spacek.
    (ANEURYSMS surg)

FIRT, P.

SURNAME (in caps); Given Names

(4)

Country: Czechoslovakia

Academic Degrees:

Affiliation: Institute of Clinical and Experimental Surgery (Ustav
                  klinicke a experimentalni chirurgie), Prague; Director
                  (Reditel): Prof Dr B Spacek

Source: Prague, Prakticky Lekar, Vol 41, No 17, 5 September 1961,
                  pp 748-751

Data: "The Present-Day Possibilities of Reconstructive
                  Surgery of the Arteries."

        Authors:

                HEJHAL, L, MUDr
                HEJHAL, J, MUDr
                FIRT, P, MUDr

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HEJHAL, L.; FIRT, P.; MICHAL, V.; HEJNAL, J.

On some problems in contemporary arterial surgery.   Rozhl. chir. 42 no.1:3-7 Ja '63.

1. Ustav klinicke a experimentalni chirurgie v Praze, reditel prof. dr. B. Spacek, DrSc.
        (ARTERIES)   (VASCULAR SURGERY)

MICHAL, V.; HEJNAL, J.; HEJHAL, L.; FIRT, P.

Surgery of the arteries of the extremities. Rozhl. chir. 42 no.1:
8-13 Ja '63.

1. Ustav klinicke a experimentalni chirurgie v Praze, reditel prof.
dr. B. Spacek, DrSc.
        (VASCULAR SURGERY)   (ARTERIOSCLEROSIS)   (EXTREMITIES)
                (INTERMITTENT CLAUDICATION)

FIRT, P.; MICHAL, V.; HEJNAL, J.; HEJHAL, L.

Contribution to the surgery of aortic iliac occulsions. Roshl. chir.
42 no.1:17-27 Ja '63.

1. Ustav klinicke a experimentalni chirurgie v Praze, reditel prof.
dr. B. Spacek, DrSc.
        (AORTA)   (ILIAC ARTERY)   (VASCULAR DISEASES)
            (VASCULAR SURGERY)   (BLOOD VESSEL TRANSPLANTATION)

PODLAHA, J.; DVORAK, J.; BARTOS, J.; CIKL, M.; FIRT, P.; FISCHER, J.;
    HEJHAL, L,; MASURKA, V.; RECEK, J.; TOMSU, M.

Clinical experiences with vascular protheses with curled polyester
silk. Rozhl. chir. 42 no.1:28-30 Ja '63.

1. Ustav klinicke a experimentalni chirurgie v Praze, reditel prof.
dr. B. Spacek, DrSc. a ostatni zucastnena pracoviste.
        (VASCULAR SURGERY)   (ANGIOGRAPHY)   (PLASTICS)
                (BLOOD VESSEL PROTHESIS)

HEJNAL, J.; HEJHAL, L.; FIRT, P.; MICHAL, V.

Diagnosis and surgical treatment of vasorenal hypertension. Rozhl. chir.
42 no.1:44-54 Ja '63.

1. Ustav klinicke a experimentalni chirurgie v Praze, reditel prof.
dr B. Spacek, DrSc.
(HYPERTENSION RENAL)   (ANGIOGRAPHY) (RENAL ARTERY OBSTRUCTION)
(SPLENIC ARTERY)

GEYNAL, Ya. [Hejnal, J.]; GEYGAL, L. [Hejgal, L.]; FIRT, P.; MIKHAL, V. [Michal, V.]

Surgical treatment of vasorenal hypertension. Khirurgiia 40 no.7:68-75 Jl '64.   (MIRA 18:2)

1. Institut klinicheskoy i eksperimental'noy khirurgii (dir. - chlen-korrespoi dent Chekhoslovatskoy akademii nauk prof. B. Shpachek [Spacek, B.]), Praga.

FIRT, P.; MIKHAL, V. [Michal, V.]; GEYNAL, Ya. [Hejnal, J.]; GEYGAL, L. [Hejgal, L.]

Reconstructive surgery in obliterating arteriosclerosis of the abdominal aorta and iliac arteries. Khirurgiia 40 no.7:75-83 Jl '64.   (MIRA 18:2)

1. Institut klinicheskoy i eksperimental'noy khirurgii (dir. - chlen-korrespordent Chekhoslovatskoy akademii nauk prof. B. Shpachek [Spacek, B.]), Praga.

HEJHAL, L.; HEJNAL, J.; FIRT, P.; MICHAL, V.

Preventive administration of penicillin in surgical reconstruction of arteries. Rozhl. chir. 44 no.5:301-305 My'65.

1. Ustav klinicke a experimentalni chirurgie v Praze (reditel: prof. dr. B. Spacek, DrSc.).

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2.4.4200

1327, 1191, 2607, 2807

Z/026/61/006/002/001/004
26318
D231/D304

AUTHOR: Firt, Vladimír, Engineer

TITLE: The calculation of ordinate values by the transformation of a homogeous system of algebraic equations

PERIODICAL: Aplikace matematiky, v. 6, no. 2, 1961, 91-99

TEXT: For investigating the limiting stresses of building structures and for calculating auto-vibrational frequencies of systems in unstressed conditions, as well as of systems under static axial stresses, the most frequently employed methods include the deformational and vectorial ones and the integration of differential equations, Ritz's and Galerkin's methods. In these methods one encounters the problem of evaluating the ordinate value ε_0 of a homogenous system of n algebraic equations, which are linear relative to the unknown x_i at $i = 1,2,...n$. Such a homogenous system is presented under

$$a_{1,1}x_1 + a_{1,2}x_2 + ... + a_{1,n-1}x_{n-1} + a_{1,n}x_n = 0,$$

$$a_{2,1}x_1 + a_{2,2}x_2 + ... + a_{2,n-1}x_{n-1} + a_{2,n}x_n = 0,$$

....

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The calculation of ordinate values...

$$a_{n-1,1}x_1 + a_{n-1,2}x_2 + \dots + a_{n-1,n-1}x_{n-1} + a_{n-1,n}x_n = 0, \quad (1)$$
$$a_{n,1}x_1 + a_{n,2}x_2 + \dots + a_{n,n-1}x_{n-1} + a_{n,n}x_n = 0.$$

and functions of the argument ε are given by the coefficients $a_{i,k} = f_{i,k}(\varepsilon)$. The ordinate value ε_o is governed by condition

$$\Delta(\varepsilon_o) = 0, \quad (2)$$

where the determinant $\Delta(\varepsilon)$ has the form of

$$\Delta(\varepsilon) = \begin{vmatrix} a_{1,1}, & a_{1,2}, & \dots, & a_{1,n} \\ a_{2,1}, & a_{2,2}, & \dots, & a_{2,n} \\ \vdots & \vdots & & \vdots \\ a_{n,1}, & a_{n,2}, & \dots, & a_{n,n} \end{vmatrix} \quad (3)$$

It is intended to facilitate the evaluation of the ordinate value ε_o from Eq. (2), which becomes too involved when determinant (3) is of a high order. To do this, it is proposed transforming the homogenous system of equations into a non-homogenous one and apply-

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ing the iterative method by proceeding in stages of approximations. The main advantage in this procedure is that it dispenses with the plotting of the function $\Delta(\mathcal{E})$ in a graph for interpolation. The proposed method divides each of the system (1) equations by $x_n \neq 0$, thus obtaining the non-homogenous system

$$a_{1,1} \frac{x_1}{x_n} + a_{1,2} \frac{x_2}{x_n} + \ldots + a_{1,n-1} \frac{x_{n-1}}{x_n} = -a_{1,n},$$

$$a_{2,1} \frac{x_1}{x_n} + a_{2,2} \frac{x_2}{x_n} + \ldots + a_{2,n-1} \frac{x_{n-1}}{x_n} = -a_{2,n}, \qquad (5)$$

$$\bullet$$

$$a_{n-1,1} \frac{x_1}{x_n} + a_{n-1,2} \frac{x_2}{x_n} + \ldots + a_{n-1,n-1} \frac{x_{n-1}}{x_n} = -a_{n-1,n}.$$

and

$$a_{n,1} \frac{x_1}{x_n} + a_{n,2} \frac{x_2}{x_n} + \ldots + a_{n,n-1} \frac{x_{n-1}}{x_n} + a_{n,n} = 0. \quad (6)$$

In the first approximation an arbitrary value (o)   is taken for

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the ordinate value ε_0 of the nought order and the values of the
coefficients $^{(o)}a_{i,k} = f_{i,k} (^{(o)}\varepsilon)$ are calculated. By Gaussian
elimination, by iteration or by some other method, the ratios

$^{(o)}\left(\dfrac{x_i}{x_n}\right)$ at $i = 1,2, \ldots n - 1$ are evaluated from the identities

in (5), and these ratios are approximate because they were derived
from the approximate values $^{(o)}a_{i,k}$. The values $^{(o)}a_{n,k} = f_{n,k}$
$(^{(o)}\varepsilon)$ and $^{(o)}\left(\dfrac{x_i}{x_n}\right)$ are inserted into Eq. (6) and the function

(1) $\bar{\Phi}(\varepsilon) = {}^{(o)}\left(\dfrac{x_1}{x_n}\right)a_{n,1} + {}^{(o)}\left(\dfrac{x_2}{x_n}\right)a_{n,2} + \ldots + {}^{(o)}\left(\dfrac{x_{n-1}}{x_n}\right)$

$$a_{n,n-1} + a_{n,n} \qquad (7)$$

thus obtained is plotted in a graph, where $^{(o)}\left(\dfrac{x_i}{x_n}\right)$ are constants

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and only the coefficients $a_{n,k}$ are functions of the argument ε. Approximation $^{(1)}\varepsilon$ is the root of the equation $^{(1)}\Phi(\varepsilon) = 0$. Similarly, for the second approximation the values of the coefficients $^{(1)}a_{i,k} = f_{i,k}(^{(1)}\varepsilon)$ are calculated and then the ratios $^{(1)}\dfrac{x_i}{x_n}$

at $i = 1,2, \ldots n-1$ are established by solving Eq. (5) with these coefficients $^{(1)}a_{i,k}$. The graph of function

$$(2)\ \Phi(\varepsilon) = {}^{(1)}\left(\frac{x_1}{x_n}\right) a_{n,1} + {}^{(1)}\left(\frac{x_2}{x_n}\right) a_{n,2} + \ldots + {}^{(1)}\frac{x_{n-1}}{x_n}$$

$$a_{n,n-1} + a_{n,n}, \tag{8}$$

is then plotted with the constant ratios $^{(1)}\left(\dfrac{x_i}{x_n}\right)$ and with the

coefficients $a_{n,k}$ which are functions of the argument ε. The root of equation $(2)\ \Phi(\varepsilon) = 0$, namely $^{(2)}\varepsilon$, is the second approximation of the ordinate value ε_0. Generally, the value $^{(m)}\varepsilon$ will be a

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sufficiently close approximation of ε_0 if its difference from the preceding value $(m-1)\varepsilon$ is "sufficiently small". Two numerical examples demonstrate the application of this method for calculating the minimum value of the limiting stress range of a frame (Fig. 1a), pertaining in the first example to the shape of deflection which is defined by the relative displacement δ of the cross-sections of pillar heads (Fig. 1b); in the second example the same frame is restrained in position by struts (Fig. 1c). In both cases the moment of pillar inertia, the length of struts, the height of frame and the ratios of stresses $N_{i,kr}$ are given. In the first example the homogenous system

$$[L_1(\varepsilon_1) + 4k]\phi_1 \qquad + 2k\phi_2 \qquad -L_3(\varepsilon_1)\psi = 0,$$
$$2k\phi_1 + [L_1(\varepsilon_2) + 8k]\phi_2 \qquad + 2k\phi_3 - L_3(\varepsilon_2)\psi = 0,$$
$$2k\phi_2 + [L_1(\varepsilon_3) + 4k]\phi_3 - L_3(\varepsilon_3)\psi = 0,$$
$$L_3(\varepsilon_1)\phi_1 \qquad + L_3(\varepsilon_2)\phi_2 \qquad + L_3(\varepsilon_3)\phi_3 -$$
$$- [L_4(\varepsilon_1) + L_4(\varepsilon_2) + L_4(\varepsilon_3)]\psi = 0,$$

(11)

is transformed into the non-homogenous one

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$$\left[L_1(\epsilon_1) + 4k\right] \frac{\phi_1}{\psi} \quad + 2k \frac{\phi_2}{\psi} \quad = L_3(\epsilon_1),$$

$$2k \frac{\phi_1}{\psi} + \left[L_1(\epsilon_2) + 8k\right] \frac{\phi_2}{\psi} \quad + 2k \frac{\phi_3}{\psi} = L_3(\epsilon_2),$$

$$2k \frac{\phi_2}{\psi} + \left[L_1(\epsilon_3) + 4k\right] \frac{\phi_3}{\psi} = L_3(\epsilon_3),$$

$$L_3(\epsilon_1) \frac{\phi_1}{\psi} \quad + L_3(\epsilon_2) \frac{\phi_2}{\psi} \quad + L_3(\epsilon_3) \frac{\phi_3}{\psi} - \left[L_4(\epsilon_1) + L_4(\epsilon_2) + \right.$$

$$\left. + L_4(\epsilon_3)\right] = 0.$$

(12)

and both approximations are evaluated numerically, the second
approximation also graphically (Fig. 2). In the second example one
approximation suffices. It is generally concluded that identity
(6) can be chosen deliberately from Eq. (1) and, provided that the
ratios x_i/x_n are known accurately, ϵ_o can be computed from any of
the system (5) or (6) equations. Taking the numerical examples,
the most convenient form of Eq. (6) to be chosen out of the system
(1) equations would be one, the right hand side of which represents
a stress condition with constructional deformations similar to the

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investigated shape of deflection. There are 2 figures and 5 refer-
ences: 3 Soviet-bloc and 2 non-Soviet-bloc. The reference to the
English-language publication reads as follows: F. Bleich, Buckling
Strength of Metal Structures, McGraw-Hill Book Company, Inc. New
York, 1952.

ASSOCIATION: Ústav teorické a aplikované mechaniky ČSAV, Praha
                (Institute for Theoretical and Applied Mechanics,
                Czechoslovak AS, Prague)

SUBMITTED: September 18, 1960

                                Fig. 2
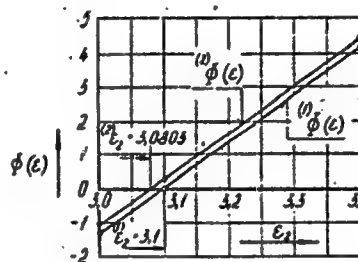
Obr. 2.

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24,4100 (1103, 1.109, 1191)

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D236/D305

AUTHOR: Firt, Vladimír, Engineer

TITLE: Contribution to determining characteristic roots

PERIODICAL: Aplikace matematiky, v. 7, no. 1, 1962, 51-73

TEXT: The article describes four methods for determining characte-
ristic roots based on the transformation of the homogeneous system
of algebraic (linear) equations

$$
\begin{aligned}
a_{1,1}x_1 + a_{1,2}x_2 + \ldots + a_{1,n-1}x_{n-1} + a_{1,n}x_n &= 0, \\
a_{2,1}x_1 + a_{2,2}x_2 + \ldots + a_{2,n-1}x_{n-1} + a_{2,n}x_n &= 0, \\
&\vdots \\
a_{n-1,1}x_1 + a_{n-1,2}x_2 + \ldots + a_{n-1,n-1}x_{n-1} + a_{n-1,n}x_n &= 0, \\
a_{n,1}x_1 + a_{n,2}x_2 + \ldots + a_{n,n-1}x_{n-1} + a_{n,n}x_n &= 0,
\end{aligned}
$$

(1)

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The first method is used for determination of the characteristic frequencies of a framework (Fig. 1). The root λ_0 is obtained as the root of the equation $A(\lambda) = 0$, the function $A(\lambda)$ being defined by

$$A(\lambda) = a_{n,1} \frac{x_1}{x_n} + a_{n,2} \frac{x_2}{x_n} + \dots + a_{n,n-1} \frac{x_{n-1}}{x_n} + a_{n,n} \qquad (7)$$

and the values of

$$a_{1,1} \frac{x_1}{x_n} + a_{1,2} \frac{x_2}{x_n} + \dots + a_{1,n-1} \frac{x_{n-1}}{x_n} = -a_{1,n},$$

$$a_{2,1} \frac{x_1}{x_n} + a_{2,2} \frac{x_2}{x_n} + \dots + a_{2,n-1} \frac{x_{n-1}}{x_n} = -a_{2,n},$$

$$\dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots$$

$$a_{n-1,1} \frac{x_1}{x_n} + a_{n-1,2} \frac{x_2}{x_n} + \dots + a_{n-1,n-1} \frac{x_{n-1}}{x_n} = -a_{n-1,n}. \qquad (8)$$

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are used instead of x_i/x_n, $i = 1,2,\ldots,n-1$. In the special case shown in

$$
\begin{aligned}
a_{1,1}x_1 &+ a_{1,2}x_2 &&&&= 0, \\
a_{2,1}x_1 &+ a_{2,2}x_2 &+ a_{2,3}x_3 &&&= 0, \\
&\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots \\
a_{n-2,1} &+ a_{n-2,2}x_2 &+ \ldots + a_{n-2,n-1}x_{n-1} &&&= 0, \\
a_{n-1,1}x_1 &+ a_{n-1,2}x_2 &+ \ldots + a_{n-1,n-1}x_{n-1} &+ a_{n-1,n}x_n &= 0, \\
a_{n,1}x_1 &+ a_{n,2}x_2 &+ \ldots + a_{n,n-1}x_{n-1} &+ a_{n,n}x_n &= 0.
\end{aligned}
\tag{12}
$$

the function $A_1(\lambda)$ is determined by

$$
A_1(\lambda) = a_{n,1} + a_{n,2}\frac{x_2}{x_1} + a_{n,3}\frac{x_3}{x_1} + \ldots + a_{n,n}\frac{x_n}{x_1}
\tag{14}
$$

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and it is advantageous to use the equation $A_1(\lambda) = 0$. The remaining methods are all iterative. Method two is the method of normal iteration; it is based on the auxiliary system of (12), the solution of

$$a_{1,2}\frac{x_2}{x_1} \qquad\qquad\qquad\qquad\qquad = -a_{1,1},$$

$$a_{2,2}\frac{x_2}{x_1} + a_{2,3}\frac{x_3}{x_1} \qquad\qquad\qquad = -a_{2,1},$$

$$a_{3,2}\frac{x_2}{x_1} + a_{3,3}\frac{x_3}{x_1} + a_{3,4}\frac{x_4}{x_1} \qquad = -a_{3,1},$$

$$\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots$$

$$a_{n-2,2}\frac{x_2}{x_1} + a_{n-2,3}\frac{x_3}{x_1} + \ldots + a_{n-2,n-1}\frac{x_{n-1}}{x_1} \qquad = -a_{n-2,1},$$

$$a_{n-1,2}\frac{x_2}{x_1} + a_{n-1,3}\frac{x_3}{x_1} + \ldots + a_{n-1,n-1}\frac{x_{n-1}}{x_1} + a_{n-1,n}\frac{x_n}{x_1} = -a_{n-1,1}. \tag{13}$$

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and

$$a_{1,2}\frac{x_2}{x_1} = -a_{1,1} - \sum_{i=3}^{n} a_{1,i}^{(0)}\left(\frac{x_i}{x_1}\right),$$

$$a_{2,2}\frac{x_2}{x_1} + a_{2,3}\frac{x_3}{x_1} = -a_{2,1} - \sum_{i=4}^{n} a_{2,i}^{(0)}\left(\frac{x_i}{x_1}\right),$$

$$a_{3,2}\frac{x_2}{x_1} + a_{3,3}\frac{x_3}{x_1} + a_{3,4}\frac{x_4}{x_3} = -a_{3,1} - \sum_{i=5}^{n} a_{3,i}^{(0)}\left(\frac{x_i}{x_1}\right),$$

$$\cdots\cdots$$

$$a_{n-2,2}\frac{x_2}{x_1} + a_{n-2,3}\frac{x_3}{x_1} + \ldots + a_{n-2,n-1}\frac{x_{n-1}}{x_1} = -a_{n-2,1} - a_{n-2,n}^{(0)}\left(\frac{x_n}{x_1}\right)$$

$$a_{n-1,2}\frac{x_2}{x_1} + a_{n-1,3}\frac{x_3}{x_1} + \ldots + a_{n-1,n-1}\frac{x_{n-1}}{x_1} + a_{n-1,n}\frac{x_n}{x_1} = -a_{n-1,1}.$$

(20)

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The third system, the system of double iteration, is based on pre-
vious work by the author (Ref. 1: Aplikace matematiky, no. 2, 1961)
and is actually a combination of the method of the normal iteration
and the cited work by the author. The last method, that of treble
iteration, is also based on the author's previous work, forming ap-
proximations of approximations for the characteristic roots. Nume-
rical examples are given. The conditions of convergence of the me-
thods are not examined. Exact and appropriate calculation of the
first derivative of function (7) is given; four approximate equa-
tions for this function in the neighborhood of point λ (k) are al-
so given. There are 3 figures, 1 table and 9 references: 8 Soviet-
bloc and 1 non-Soviet-bloc.

ASSOCIATION: Ústav teoretické a aplikované mechaniky ČSAV (Insti-
                tute for Theoretical and Applied Mechanics Czecho-
                slovak AS)

SUBMITTED: January 11, 1961

Card 6/7

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        (FACE, neopl.
                bucco-maxillo-facial, surg., ligation of external carotid
                artery)
        (ARTERIES, CAROTID, surg.
                ligation in bucco-maxillo-facial tumors)

CATEGORY : General Problems of Pathology. Tumors. Comparative
Oncology

ABS. JOUR. : RZBiol., No. 12 1958, No. 56419

AUTHOR : Popescu, V., Firu, P., Burlibasa, C.
INST. : -
TITLE : Clinical Data on the Treatment of 121 Cases of
Tumors of the Lip

ORIG. PUB. : Stomatologia, 1956, Vol.3, No.1, 26-39

ABSTRACT : The authors' material -- 121 cases of tumors of
the lip -- included 97 involving the lower lip
(80.50%) and 20 the upper lip (16.52%). Malignant
tumors predominated (75.0%). Of these, 50 were
in the second stage (45 cases), 24 in the third
and fourth, and only 5 in the first stage. Treat-
ment was primarily surgical. The second step in
therapy -- removal of regional lymph nodes -- was
resorted to only when the latter were palpable.
Long-term results in the first two stages were
good. Some patients were followed up to 15 years.
In stages III and IV, recurrence was seen in 3 of
3 cases (from 6 months to 2 years) even with wide-
spread resection of nodes. -- P.I.Shmulevich

CARD: 1/1

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